UAB
Universitat Autònoma de Barcelona

Experimentation in Chemical Engineering II

Code: 102395
ECTS Credits: 5

2024/2025

Degree	Type	Year
2500897 Chemical Engineering	OB	3

Contact

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

- To have passed the following subjects: Balances in Chemical Engineering, Applied Thermodynamics, Chemical Kinetics, Fluid Dynamics and Computer Applications.

- Currently attending Heat Transfer.

Objectives and Contextualisation

- Writing reports on experimental works.

- Experimental verification of mass, heat and mechanical energy balances.

- Practical application of concepts introduced in subjects such as Balances in Chemical Engineering, Applied Thermodynamics, Chemical Kinetics, Fluid Dynamics, Heat Transfer and Computer Applications.

- In addition to the conceptual aspects, the organization of the work in the lab and the quality in the analysis and communication of the experimental results obtained is also very important.

Competences

- Apply scientific method to systems in which chemical, physical or biological transformations are produced both on a microscopic and macroscopic scale.
- Assume the values of professional responsibility and ethics required in chemical engineering.
- Communication
- Demonstrate knowledge of the different reaction, separation and processing operations for materials, and transport and circulation of fluids involved in the industrial processes of chemical engineering.
- Develop personal attitude.
- Develop personal work habits.
- Develop thinking habits.
- Observe ethics and professionalism.

- Understand and apply the basic principles on which chemical engineering is founded, and more precisely: balances of matter, energy and thermodynamic momentum, phase equilibrium and kinetic chemical equilibrium of the physical processes of matter, energy and momentum transfer, and kinetics of chemical reactions
- Work in a team.

Learning Outcomes

1. Adapt to multidisciplinary and international surroundings.
2. Assume social, ethical, professional and legal responsibility, if applicable, derived from professional exercise.
3. Calculate losses by friction in conduction.
4. Communicate efficiently, orally and in writing, knowledge, results and skills, both professionally and to non-expert audiences.
5. Contribute to society's welfare and to sustainable development.
6. Critically evaluate the work done.
7. Design experiments.
8. Develop a capacity for analysis, synthesis and prospection.
9. Develop curiosity and creativity.
10. Maintain a proactive and dynamic attitude with regard to one's own professional career, personal growth and continuing education. Have the will to overcome difficulties.
11. Monitor the progress of a chemical reaction
12. Perform a critical analysis of experimental results and of the overall work done.
13. Perform experiments.
14. Practice the fundamental laws of thermodynamics.
15. Prevent and solve problems.

Content

1. Lab sessions (supervised activity):

The laboratory sessions will be carried out in accordance with the schedule of practices listed below in the subjects of the new plan of the Degree in Chemical Engineering, Fluid Dynamics (2nd year, 2nd term) and Chemical Engineering Experiments I (3rd year , 2nd term). Be aware of the possible overlap and, therefore, combine the different groups scheduled for the two subjects. It is recommended to contact the teacher responsible for this subject.

Fluid Dymanics:

- Centrifugal compressor

- Centrifugal pump

- Circulation by fixed bed / fluidization

- Pressure drop in accidents

Chemical Engineering Experiments I:

- Heat Exchangers

- Heat transfer by convection

- Homogeneous kinetics

- Determination of reaction heat

- Heterogeneous kinetics

- Determination of the effective diffusion within a particle

2. Practical reports

Preparation of reports based on the data obtained in the lab. The analysis of observations carried out in the laboratory and of the results obtained is even more important than the experimental part of the subject. It is necessary to demonstrate that each practice has been understood trough the comments and analysis of the results obtained.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lab sessions	63	2.52	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15
Presentation of the subject	3	0.12	1, 2, 8, 10, 15
Type: Supervised			
Global exam	4	0.16	3, 11, 14
Type: Autonomous			
Preparation of the global exam	10	0.4	4, 12, 15
Preparation of the reports on lab practices	45	1.8	2, 3, 4, 5, 8, 9, 10, 11, 12, 14

Being an eminently practical subject, attendance at the laboratory sessions is COMPULSORY.

Please contact the responsible of this subject for the laboratory sessions schedule.

Students must wear their own lab coat, a note-book and the practice script previously studied. Contact lenses are not allowed.

The general rules of security in the lab can be found in Aula Moodle.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Attitude towards lab work	15%	0	0	1, 2, 5, 7, 8, 9, 10, 13, 15

Global exam	15 %	0	0	3, 8, 11, 12, 14, 15
Reports on the lab practices	70%	0	0	3, 4, 6, 7, 8, 11, 12, 13, 14

Attitude towards lab work: 15%

Global exam: 15%

Practical reports: 70%

a) Evaluation activities

Attendance at the lab sessions is obligatory. Every day of non-attendance discount 0.15 points out of 1.5 from the attitude in the lab mark. In addition, the mark of the practical report corresponding to the lab session to which the student has not attended will be reduced by 30%. The laboratory mark, apart from the attendance, also takes into account the attitude towards the subject (behaviour in the lab, reading the scripts and preparing the practice prior to the lab session, copy in laboratory reports or exam, etc.).

To pass the subject, in addition to attending to lab sessions and presenting the report of all the practices on the corresponding day, students must reach a minimum average mark of 60% of the reports, 60% of the grade "Attitude in the lab" and 30% in the global exam. The weighted average of these marks must be above 5 out of 10. If the minimum mark is not reached in any of these three concepts, but the weighted average of the notes obtained is above 5 out of 10, the final mark of the subject will be 4 out of 10. In the rest of the cases, it will be the average mark that has been obtained. When the mark on Attitude in the lab does not reach 60% for reasons of attendance, the final grade of the subject will be Non-Evaluable.

In order to be able to attend to the global exam, 60% of the report mark and 60% of the attitude mark must be previously reached.

b) Schedule of evaluation activities

The date for the exam can be found in the exam's calendar for the Chemical Engineering Degree on the website of the Escola d'Enginyeria. Please contact with the subject coordinator to obtain the scheduleof the lab sessions.

c) Resit process

In accordance with the School of Engineering rules regarding the eminently practical subjects, no resit exams will bescheduled.

d) Review of practical reports and global exam

For the review of the results of the practical reports and global exam, data and place will be determined within the 10 working days following the publication of the marks.

e) Qualifications

Students not attending 30% of the lab sessions or more will be deemed not eligible.

To award a student with an Honors Qualification, apart from the threshold mark stablished in UAB Regulations, different aspects of the student work and attitude will be considered: proactivity towards the subject, the manual ability in the laboratory, the understanding of the basics of the practices and its relationship with other subjects and the fluidity, reliability and reasoning capacity in situations such as those posed by practices.

f) Irregularities by the student, copy and plagiarism

Without prejudice to other disciplinary measures that are deemed appropriate, and in accordance with the current academic regulations, the irregularities committed by the student that can lead to a variation of the qualification of an act of self- evaluation will be penalised. Therefore, copying, plagiarizing, cheating, etc. a

report on lab practices or any other activity of evaluation will imply a zero (0) in the Attitude towards work in the lab and, consequently, to fail the subject.

g) Evaluation of repeating students

Specific indications for repeating students can be found in the Virtual Campus of the subject. For doubts and questions please contact Adriana Artola.

Bibliography

References can be found in the instructions for each lab practice.

Software

Practice scripts indicate the software needed in each specific case.

Language list

Information on the teaching languages can be checked on the CONTENTS section of the guide.